

## PENGARUH KOMPREGNASI FENOL FORMALDEHIDA TERHADAP SIFAT FISIKA KAYU JATI (*Tectona grandis* L.f.) UMUR MUDA ASAL KPH MADIUN

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### INTISARI

Kayu jati umur muda menunjukkan sifat-sifat yang kurang baik yang dipengaruhi oleh proporsi kayu juvenile yang tinggi. Perlakuan modifikasi melalui kompregnasi fenol formaldehida dibutuhkan untuk memperbaiki kualitas kayu jati. Tujuan dari penelitian ini adalah untuk mengetahui kemungkinan perbaikan kualitas dari sifat fisika kayu jati (*Tectona grandis* L.f.) umur muda melalui kompregnasi fenol formaldehida pada konsentrasi dan waktu tekan yang berbeda.

Penelitian ini menggunakan model rancangan percobaan pola acak lengkap (*Completely Randomized Design*). Pengaruh konsentrasi : 5%, 10%, 15% dan waktu tekan : 15 menit, 30 menit, 60 menit diamati pada parameter kualitas kayu meliputi retensi, sifat warna, dan sifat fisika kayu (kadar air, berat jenis, penyusutan dan pengembangan, serta adsorpsi dan desorpsi kayu). Analisis keragaman (ANOVA) dan uji lanjut HSD (tukey) digunakan untuk mengetahui seberapa jauh perbedaan nilai rata-rata perlakuan.

Hasil penelitian menunjukkan bahwa faktor konsentrasi fenol formaldehida berpengaruh terhadap nilai retensi sebesar 24,28 kg/m<sup>3</sup>; peningkatan nilai kemerahan kayu (a\*) sebesar 45,57% dan berat jenis sebesar 1,59%; serta penurunan pada beberapa parameter meliputi : nilai kecerahan kayu (L\*) dan kekuningan kayu (b\*) sebesar 36,56% dan 38,40%; kadar air sebesar 4,62%; penyusutan radial dan tangensial sebesar 3,73% dan 7,87%; pengembangan longitudinal sebesar 32,35%; nilai EMC pada RH 8% dengan kadar air awal kering udara dan basah sebesar 2,05% dan 0,92%; nilai EMC pada RH 33% dengan kadar air awal basah sebesar 1,76%; serta nilai EMC pada RH 81% dengan kadar air awal kering udara dan basah sebesar 5,39% dan 9,07%. Faktor lama tekan berpengaruh terhadap nilai retensi sebesar 23,75 kg/m<sup>3</sup>; peningkatan nilai kemerahan kayu (a\*) sebesar 45,57%; serta penurunan kadar air sebesar 5,58%. Interaksi faktor konsentrasi dan lama tekan tidak memberikan pengaruh pada semua parameter sifat fisika kayu.

Kata kunci: modifikasi kayu, kompregnasi, fenol formaldehida, sifat fisika, *Tectona grandis* L.f.

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**THE EFFECTS OF PHENOL FORMALDEHYDE COMPREGNATION  
ON THE PHYSICAL PROPERTIES OF YOUNG TEAK WOOD  
(*Tectona grandis* L.f) IN KPH MADIUN**

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**ABSTRACT**

Young teak wood exhibits inferior properties due to a high proportion of juvenile wood. Modification through compregnation of phenol formaldehyde is required to improve the quality of teak wood. The purpose of this study is to observe the possibility of improvement quality of the physical properties of young teak wood (*Tectona grandis* L.f.) by using phenol formaldehyde compregnation at various concentrations and pressure times.

This research employed a completely randomized design. The effect of concentration: 5%, 10%, 15% and pressure time: 15 minutes, 30 minutes, and 60 minutes were observed on the quality of wood including color properties, the retention, and physical properties (moisture contents, specific gravity, shrinkage and swelling, adsorption and desorption of the wood). Analysis of variance (ANOVA) and HSD (honestly significant difference) test is used to find out the difference in treatment according to the average values.

The results of this research showed that phenol formaldehyde concentration affected the retention with a value of 24.28 kg/m<sup>3</sup>; increasing the redness (a\*) level with a total of 45,57% and specific gravity with a total of 1,59%; and decreasing level some parameters including : the brightness (L\*) and the yellowness (b\*) with a total of 36,56% and 38,40%; the moisture contents with a total of 4,62%; the radial and tangential shrinkage with a total of 3,73% and 7,87%; the longitudinal swelling with a total of 32,35%; the EMC value at relative humidity (RH) 8% with the beginning wet and dry moisture contents each with a total of 2,05% and 0,92%; the EMC value at relative humidity (RH) 33% with the beginning dry moisture contents with a total of 1,76%; and the EMC value at relative humidity (RH) 81% with the beginning wet and dry moisture contents each with a total of 5,39% and 9,07%. The pressure times affected the retention with a value of 23.75 kg/m<sup>3</sup>; increasing the redness (a\*) with a total of 45,57%; and decreasing the moisture contents with a total of 5,58%. The interaction between the concentration and pressure times did not affect any of the physical wood properties.

Key words: wood modification, compregnation, phenol formaldehyde, physical properties, *Tectona grandis* L.f.

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